DESCRIPTION

The AM2309A is available in SOT-23 package.

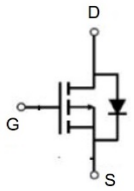
Application:

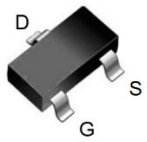
- Load Switch
- Switching Circuits
- High Speed Line Driver

FEATURE

- Low $R_{DS\ (on)}$ @V_{GS}=-10V
- 150mΩ $R_{DS\ (on)}$ @V_{GS}=-10V
- 200mΩ $R_{DS\ (on)}$ @V_{GS}=-4.5V
- -5V Logic Level Control
- P Channel SOT-23 Package

PIN DESCRIPTION





Pin#	Symbol	Function
1	G	Gate
2	S	Source
3	D	Drain

ORDERING INFORMATION

Package Type	Part Number	
SOT-23 SPQ: 3,000pcs/Reel	E3	AM2309AE3R
		AM2309AE3VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise stated.

Common Ratings		
V_{GS}, Gate-to-Source Voltage		±20V
$V_{(BR)DSS}$, Drain-Source Breakdown Voltage		-60V
T_J, Maximum Junction Temperature		150℃
T_{STG}, Storage Temperature Range		-50℃~+150℃
Mounted on Large Heat Sink		
I_{DM}, Pulse Drain Current Tested (1)	T_A=25℃	-8A
I_D, Continuous Drain Current	T_A=25℃	-2A
	T_A=70℃	-1.6A
P_D, Maximum Power Dissipation	T_A=25℃	1W
	T_A=70℃	0.8W
$R_{\theta JA}$, Thermal Resistance Junction-Ambient		125℃/W

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) Pulse width limited by maximum allowable junction temperature

ELECTRICAL CHARACTERISTICS

T_J = 25°C, unless otherwise stated.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V, T_A=25℃	-	-	-1	μA
		V_{DS}=-60V, V_{GS}=0V, T_A=125℃	-	-	-100	
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS},I_D=-250μA	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance (1)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-2A	-	150	200	mΩ
		V_{GS}=-4.5V, ID=-1A	-	200	300	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-30V, V_{GS}=0V, f=1MHz	-	310	-	pF
Output Capacitance	C_{oss}		-	22	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Total Gate Charge	Q_g	V_{DS}=-30V, I_D=-2A V_{GS}=-10V	-	5.4	-	nC
Gate Source Charge	Q_{gs}		-	1.1	-	
Gate Drain Charge	Q_{gd}		-	1.6	-	
Switching Characteristics						
Turn on Delay Time	$t_{d\ (ON)}$	I_D=-2A, V_{DD}=-30V, V_{GS}=-10V, R_G=3.3Ω	-	41	-	ns
Turn on Rise Time	t_r		-	22	-	
Turn Off Delay Time	$t_{d\ (OFF)}$		-	25	-	
Turn Off Fall Time	t_f		-	32	-	
Source Drain Diode Characteristics						
Source Drain Current (Body Diode)	I_{SD}	T_A=25℃	-	-	-1.4	A
Forward on Voltage (1)	V_{SD}	T_J=25℃,I_{SD}=-2A , V_{GS}=0V	-	-0.84	-1.2	V

(1) Pulse test ; Pulse width≤300μs, duty cycle≤2%.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

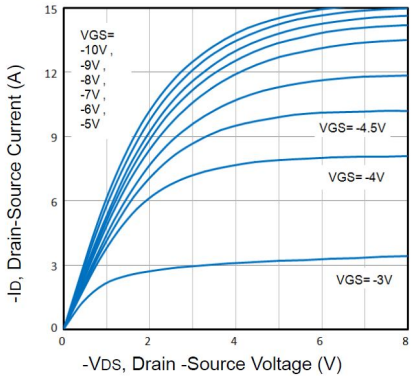


Fig 2. Normalized Threshold Voltage vs. Temperature

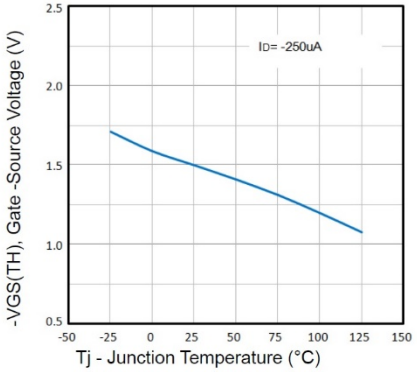


Fig3. Typical Transfer Characteristics

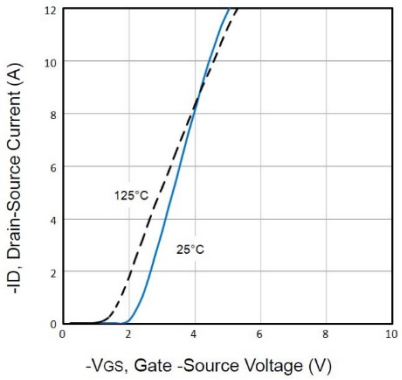


Fig4. Drain-Source Voltage vs. Gate-Source Voltage

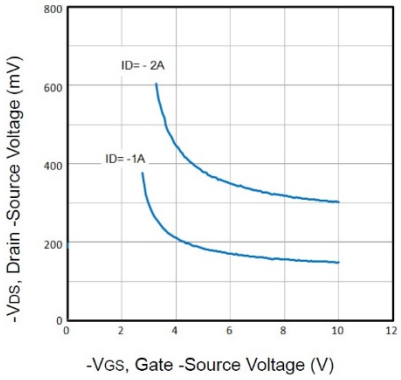


Fig5. Typical Source-Drain Diode Forward Voltage

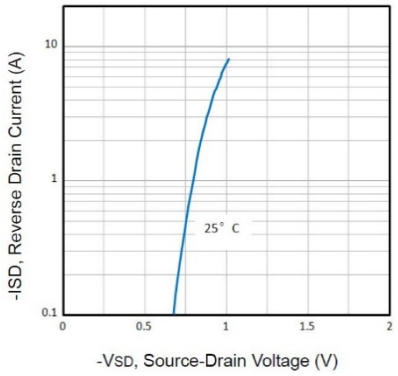


Fig6. Maximum Safe Operating Area

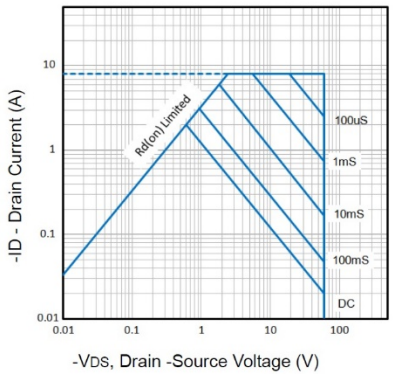


Fig7. Typical Capacitance vs. Drain-Source Voltage

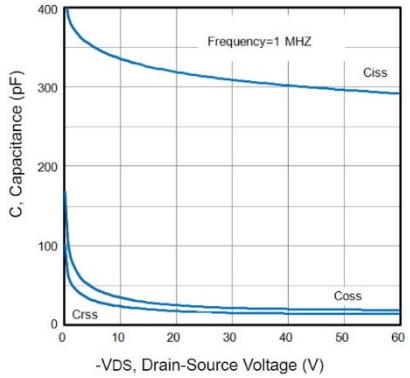


Fig8. Typical Gate Charge vs. Gate-Source Voltage

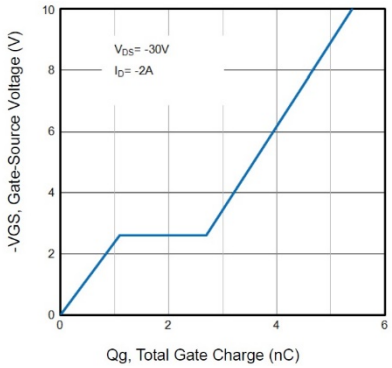


Fig9. Normalized Maximum Transient Thermal Impedance

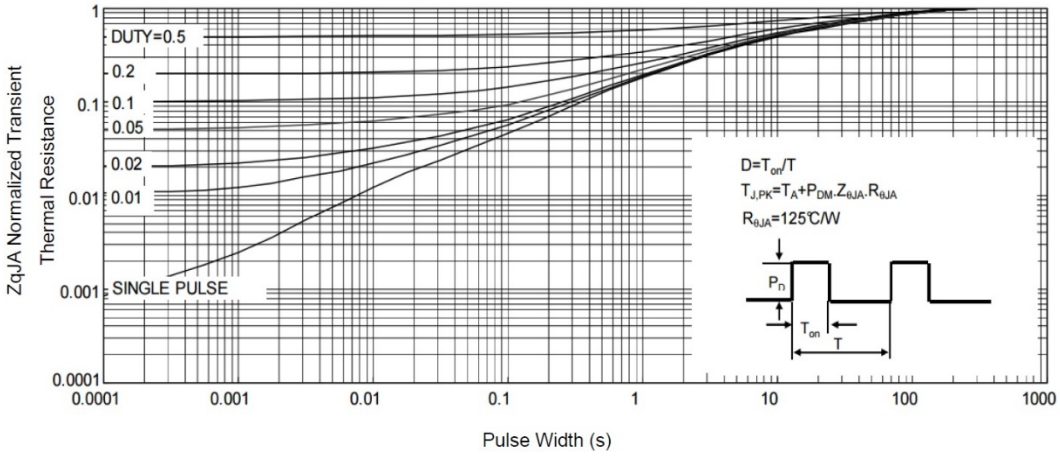
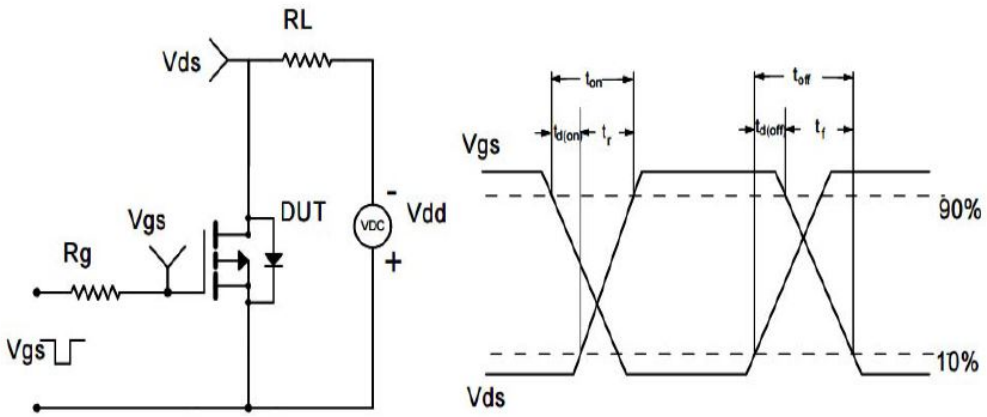
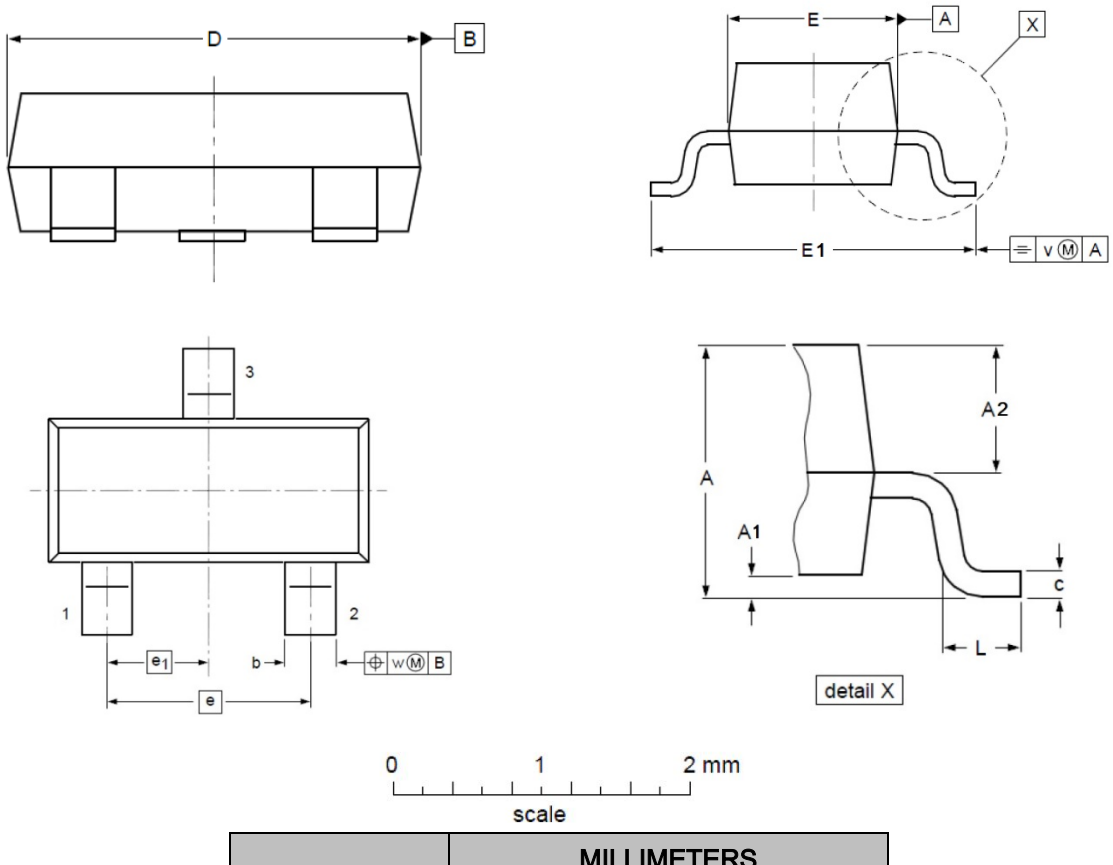


Fig10. Switching Time Test Circuit and waveforms



PACKAGE INFORMATION

Dimension in SOT-23 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	0.900	1.150
A1	0.010	0.100
A2	0.450	0.550
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950 (TYP)	
e1	1.900 (TYP)	
L	0.300	0.500

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